

**Topic 3 Bushfire Behaviour How a house is attacked
– an introduction**

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I've spent roughly 26 years delving into the nooks and crannies of: how to improve our houses in the wake of bushfires.

In terms of a bushfire itself, we do a unique thing and actually study bushfires from the perspective of the house. So, what is it like to experience a bushfire from the house's perspective? And, I guess once you put that lens on, you start to imagine what experiential processes this house will experience, and what are the mechanisms and processes of how it might respond to those things.

And, I guess, as you look into it, it's a far more complex set of actions and processes than simply a fire front turning up and spraying some embers around. There's so many extra nuances around the specific location of the house, and its proximity to other what typically are non-bushfire elements that either play roles as barriers or as additional fuel sources in those environments. I'm going to focus on all those processes, and how to harden a house and prepare its surroundings to eliminate the potential negative impacts of those other processes.

Ember Attack
Debris Accumulation
Surface Fire
Consequential fire
Radiant Heat
Flame Front contact
Wind
Tree strike

Most Prevalent cause of loss



Least Prevalent cause of loss

Now, if we list these processes out, this is a fairly good profile of what we're up against.

Ember attack.

Debris accumulation, which happens over the months and years building up to a bushfire.

Surface fire, which is the low-level surface fuels that are burnt out when fire fronts arrive, and it helps, and ignited and reignited by embers.

Consequential fire might be a new term you haven't heard before, but it's the term we use to describe heavy fuel elements that burn near houses and present an additional heat load might be radiant heat or flame contact or it might challenge someone's ability to leave a

burning house. But a consequential fire is all what we call heavy fuels, and that might be a vehicle or a fence, or a retaining wall, or even a wheelie bin. So, consequential fire is a very important aspect of preparing a home, or having a home adequately built to resist.

Radiant heat is what we all come to know and understand. Radiant heat from a fire front some distance away. The flame front and its ability to contact the house.

Wind action, which is a very important process that's almost ubiquitous in bushfires, where these winds can directly act on the house and weaken them.

And, of course, tree strike.

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Highest Priority



Lowest Priority

So, I've actually listed them in a deliberate order, from the ones that are most prevalent in causing structural loss through to the ones that are least prevalent. So, this gives us a bit of a guide to move through a list, from the most crucial things to begin and address first, and move further and further down the list to the lesser important ones. But, of course, for all circumstances I'd strongly encourage you to work through the entire list.

So, in terms of the process of trying to unpack, how do we solve each of these actions? It's important to recognize that they're not all created equal in terms of the best way to approach them.

Ember Attack	House	X	Landscape
Debris Accumulation	House	X	Landscape
Surface Fire	House	X	Landscape
Consequential fire	House		X Landscape
Radiant Heat	House	X	Landscape
Flame Front contact	House		X Landscape
Wind	House	X	Landscape
Tree strike	House		X Landscape

And, what I've put up here is a profile of whether a particular attack mechanism is easier to resolve through house design and upgrade, or modification, or it's more easily addressed through landscaping and removal of it as an action on the house.

Now, if we move through these, it becomes fairly clear ember attack, which is quite a prolific process in the landscape, and embers are spraying everywhere in a bushfire context, it's almost impossible to imagine that we could eliminate ember attack by clearing enough vegetation and enough sources of embers. It's just simply not a practical process to go for elimination from a landscape approach. However, solving it from a house design perspective is relatively straightforward. So, that's why we have an 'X' leaning well over against the house side of the process.

Conversely, if we look at something like tree strike, at the bottom of the list here, you can imagine that designing a house strong enough to withstand tree strike is near impossible. However, managing the trees and providing a sufficient buffer by managing the trees in the landscape side of the process is relatively straightforward. So, this just gives us a nice handy guide and I'll come back to this a few times throughout the presentation.